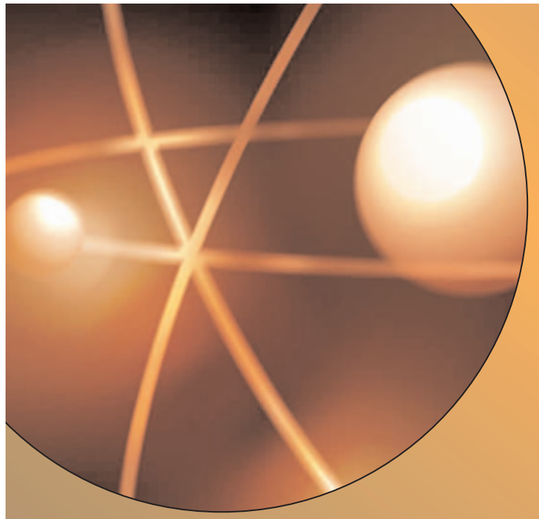


In partnership with local public school districts, the Lab designs and provides programs to enhance the quality of K-12 science, math, and technology education. These programs include Jefferson Lab immersion experiences for 6th, 7th, and 8th grade students (BEAMS); a four-week course in physical science for teachers (TAPS); summer research internships for high school honor students; evening public lectures presented by scientists; and classroom visits and field trips tailored to the classroom teachers' needs.

Jefferson Lab participates in several community partnerships to make science, math, and technology an integral part of people's lives. The Lab was named the 2002 Business Partner of the Year by the Cooperating Hampton Roads Organizations for Minorities in Engineering (CHROME). CHROME is an organization of business, government, and school district partners that sponsor science and engineering clubs for female and minority students.

Jefferson Lab Physics Fest

During the school year, students can attend a presentation on Jefferson Lab's science and technology and participate in a hands-on demonstration of electrostatics, cryogenics and plasmas. Seating is limited, reservations are required. (757) 269-7560

A community favorite: JLab's Cryogenics demonstration

Education Web Site
http://education.jlab.org

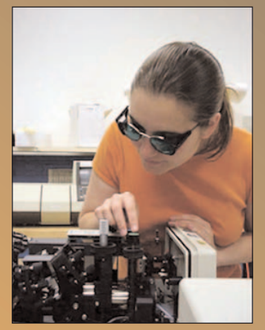
The Jefferson Lab Science Education website was created to make the Lab's expertise available to a nationwide audience of students, teachers, and the general public. The site currently receives about 4000 visitors a day.

Thomas Jefferson National Accelerator Facility
Office of Science Education
12000 Jefferson Avenue Newport News, VA 23606
Phone: (757) 269-7567 Fax: (757) 269-5065
Email: education@jlab.org

To learn more about Jefferson Lab, visit the Lab's website: www.jlab.org or call (757) 269-7100

U.S. Department of Energy Office of Science

Thomas Jefferson National Accelerator Facility (Jefferson Lab)



Jefferson Lab Science Education Programs

(K-12 and Undergraduate)

http://education.jlab.org

Jefferson Lab's Science Education Program

Jefferson Lab is a premier Nuclear Physics research facility in the United States, providing an international user community with a scientific instrument and research opportunities that are unique in the world. Built, managed, and operated by the Southeastern Universities Research Association (SURA) for the U.S. Department of Energy's Office of Science, Jefferson Lab's primary research mission is to expand the understanding of the structure of matter and the forces that hold the atom's nucleus together.

Jefferson Lab is a valued contributor and major resource to the local, regional, and national education communities at the K-12 and undergraduate level. Jefferson Lab strengthens university physics programs through shared faculty appointments. Funded by the DOE Office of Science, the Science Undergraduate Laboratory Internship (SULI) and Pre-Service Teachers (PST) programs offer opportunities for the nation's top undergraduate science students to immerse themselves in the science of Jefferson Lab for 10 weeks in the summer. The SULI and PST programs feature student interaction with staff and scientists in a world-class research environment.

Becoming Enthusiastic About Math and Science

The BEAMS (Becoming Enthusiastic About Math and Science) program brings classes of 6th, 7th, and 8th grade at-risk students (1800 per year) and their teachers to Jefferson Lab for science and math interactive activities. The goals of the program are to:

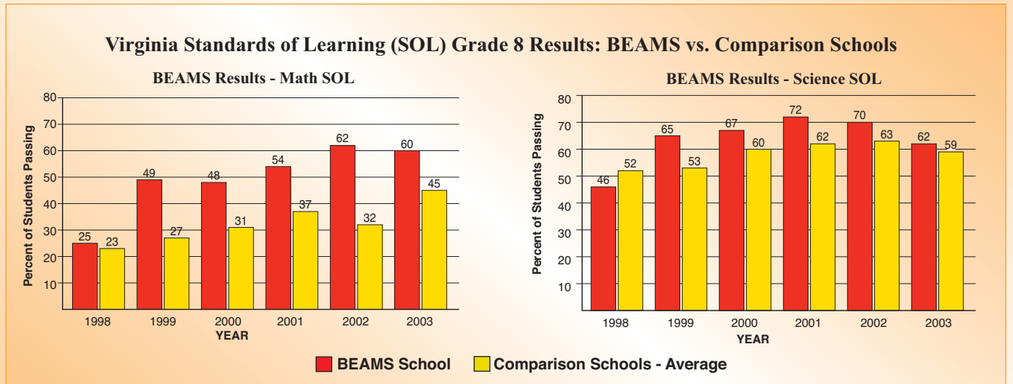
- Increase the representation of minorities and women in the science and engineering workforce,
- Motivate students and strengthen their academic preparation, and
- Provide teachers with classroom activities based on the science and technology at Jefferson Lab.

Sixth grade students and their teachers spend five days immersed in Jefferson Lab's research environment interacting with scientists, engineers, and technicians as they participate in science and math activities. As these students progress through the 7th and 8th grades, additional Jefferson Lab-oriented education opportunities are provided.

BEAMS Evaluation Results:

Evaluation is a critical component of Jefferson Lab's education programs. An assessment is made of the Lab's impact and effectiveness in contributing to student achievement as defined by the National Science Education Goals and Virginia Standards of Learning.

- In comparison to control students,
  - Students better understand the importance of math and science
  - Girls' perception of opportunities for women as scientists increases
  - Students gain a more realistic understanding of scientists' roles
- Teachers' understanding and awareness of science, applications, and careers increases
- Parents report BEAMS positively influences their children's understanding and awareness of science, applications, and careers



SOL results indicate that students participating in BEAMS are performing better academically than students at comparable at-risk schools not participating in BEAMS

As part of the BEAMS program, the Lab hosts a family night for participating students' families to support parents' involvement in their child's education and reinforce the BEAMS experience.

BEAMS is a National Model:

- Selected as one of 50 programs showcased at the "Communicating the Future: Best Practices for Communication and Technology to the Public" conference sponsored by the U.S. Department of Energy Office of Science, the National Institute of Standards and Technology, and the U.S. Department of Commerce.
- Sparked the NASA-Goddard Space Flight Center **S**tudents **U**nited with **N**ASA **B**ecome **E**nthusiastic **A**bout **M**ath and **S**cience (SUNBEAMS) program.
- Recognized by the National Academy of Science RISE (Resources for Involving Scientists in Education) project as one of only 13 K-12 science education programs where scientists, engineers, and other community members play especially effective roles.

DOE Office of Science Education Initiatives

Teacher Academy in Physical Science (TAPS)

TAPS is a four-week program for upper elementary and middle school teachers with the following components: a course in basic physics (50 hours), guest lectures on current research by Lab staff (20 hours), workshops on improving physical science instruction at the middle school level (20 hours), and team-based hands-on explorations under the guidance of JLab staff (70 hours).

The goals of the program are to:

- enhance teacher content knowledge and skills, including leadership skills;
- increase teacher awareness and ability to communicate with their students about current issues in science and technology;
- build teacher competence and confidence by offering teachers an opportunity for revitalization and recognition; and
- support the inclusion of each teacher as a valued member of the professional science and technology community.

Science Undergraduate Laboratory Internship (SULI)

The SULI internship program supports the advancement of undergraduate students interested in careers in scientific and engineering fields. Students work with scientists or engineers for 10 weeks on projects related to Jefferson Lab's research program. SULI prepares students to pursue professional careers and graduate school opportunities as they become part of the Lab's research environment and establish long-term research relationships with JLab scientists and engineers. Students can apply online at: *www.scied.science.doe.gov*

Pre-Service Teachers (PST)

The PST ten-week internship program provides educational training and research experiences for undergraduate students preparing to become K-12 science teachers. Each student has two mentors, a local physics teacher and a Lab scientist, to maximize the building of content knowledge and skills through the research experience. Students can apply online at: *www.scied.science.doe.gov*